

I claim:

1. A stent for insertion into a corporeal vessel, comprising:

a stent body having proximal and distal ends and an outer surface, and

at least one longitudinal projection external to said stent outer surface,

5 wherein each longitudinal projection acts as a rail to reduce the contact area between the stent and the vessel wall during insertion of the stent.

2. The stent of Claim 1 which has a generally circular cross-section.

3. The stent of Claim 1, wherein at least one longitudinal projection extends from

10 a point at or adjacent to the distal end of the stent to a point at or adjacent to the proximal end of the stent.

4. The device of Claim 1, wherein the stent includes at least three longitudinal projections.

5. The device of Claim 4, wherein said at least three projections are equidistantly spaced around the circumference of the stent.

15 6. The device of Claim 1, wherein the distal end of each longitudinal projection is tapered.

7. The device of Claim 1, wherein after the stent is inserted into the vessel, the stent is expanded by balloon inflation.

20 8. The device of Claim 1, wherein after the stent is inserted into the vessel, the stent is expanded by shape memory.

9. The device of Claim 1, wherein after the stent is inserted into the vessel, the stent is expanded by self-expansion.

10. The device of Claim 1, wherein at least one longitudinal projection acts as a stress concentrator, such that for a given stent expansion force the stresses at a portion of a stenosis in contact with the longitudinal projection is greatly magnified, allowing the stenosis to expand at lower pressures than if the projection were not present.

5 11. The stent of Claim 1, wherein at least one longitudinal projection has a circular, trapezoidal, or triangular cross-section.

12. The stent of Claim 1, wherein at least one longitudinal projection is formed integral with the stent wall surface.

10 13. The stent of Claim 1, wherein at least one longitudinal projection is attached to the stent wall surface.

14. The stent of Claim 1, wherein at least one longitudinal projection is flexible.

15 15. The stent of Claim 1, wherein at least one longitudinal projection has a helical configuration.

16. A stent for insertion into a corporeal vessel, comprising:

a stent body having proximal and distal ends on an outer surface, and

at least three projections external to said stent outer surface,

wherein each projection acts as a rail to reduce the contact area between the stent and the vessel wall.

17. The stent of Claim 16 which has a generally circular cross-section.

20 18. The stent of Claim 16, wherein at least one projection is longitudinal.

19. The stent of Claim 18, wherein at least one longitudinal projection extends from a point at or adjacent to the distal end of the stent to a point at or adjacent to the proximal end of the stent.

20. The stent of Claim 18, wherein the stent includes at least three longitudinal projections.

21. The stent of Claim 16, wherein said at least three projections are equidistantly spaced around the circumference of the stent.

5 22. The stent of Claim 18, wherein the distal end of each longitudinal projection is tapered.

23. The stent of Claim 16, wherein after the stent is inserted into the vessel, the stent is expanded by balloon inflation.

10 24. The stent of Claim 16, wherein after the stent is inserted into the vessel, the stent is expanded by shape memory.

25. The stent of Claim 16, wherein after the stent is inserted into the vessel, the stent is expanded by self-expansion.

15 26. The stent of Claim 18, wherein each longitudinal projection acts as a stress concentrator, such that for a given stent expansion force the stresses at a portion of a stenosis in contact with the longitudinal projection is greatly magnified, allowing the stenosis to expand at lower pressures than if the projection were not present.

27. The stent of Claim 18, wherein each longitudinal projection has a circular, trapezoidal, or triangular cross-section.

20 28. The stent of Claim 16, wherein at least one projection is formed integral with the stent wall surface.

29. The stent of Claim 16, wherein at least one projection is attached to the stent wall surface.

30. The stent of Claim 1, wherein at least one projection is flexible.

31. The stent of Claim 1, wherein at least one projection has a helical configuration.

32. A method of magnifying stresses at a portion of a stenosis in contact with a stent, the stent including a distal end and a proximal end and having a circular cross-section,
5 the method comprising the steps of limiting the initial contact area between a vessel wall and the stent to at least one projection, said projection being external to the surface of the stent and acting as a stress concentrator such that for a given stent expansion force, the stresses at a portion of a stenosis in contact with said projection are greatly magnified, allowing the stenosis to expand at lower pressures than if said at least one projection were not present.

10 33. The method of Claim 32, wherein at least one projection extends from the distal to the proximal end of said stent.

34. The method of Claim 32, wherein there are at least two projections equidistantly spaced around the circumference of the stent.

15 35. The method of Claim 32, wherein each projection is tapered at the distal end to facilitate crossing an undilated stenotic segment.

36. The method of Claim 32, wherein the stent comprises at least one longitudinal projection.

37. The method of Claim 36, wherein the stent comprises three longitudinal projections.